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ABSTRACT

The construct of egocentrism within Piaget's theory of intellectual development was evaluated as to its convergent, discriminant, and predictive validity within the concrete-operational stage. A total of eighty Negro children drawn from grades one through four in low and middle socioeconomic level schools, were tested individually on a total of six tests. It was hypothesized that there is a high correlation among three types of egocentrism tasks: space, communication, and role-taking (convergent validity), and a similar relation exists between each task and "decentering" ability. It was further predicted that egocentric performance is not related to oral reading ability (discriminant validity), but is related to two peer-status variables of popularity and leadership (predictive validity). Individual differences associated with egocentrism were also explored. None of the major hypotheses were fully supported in preliminary analyses. The correlations among the three egocentrism tasks in the total sample were negligible. Egocentric performance does not vary significantly as a function of sex, socioeconomic status, or intelligence. With one exception, egocentrism is significantly but only moderately related to chronological age and mental age. (Author)

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EGOCENTRISM IN CHILDREN:
ITS GENERALITY AND CORRELATES

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Abstract

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The construct of egocentrism within Piaget's theory of intellectual development was evaluated as to its convergent discriminant and predictive validity within the concrete-operational stage. Eighty Negro children drawn from grades 1 through 4 in low- and middle-socioeconomic shcools were tested individually on a total of six tests. It was hypothesized that there is a high correlation among three types of egocentrism tasks: space, communication, and role-taking (convergent validity), and a similar relation exists between each task and "decentering" ability. It was further predicted that egocentric performance is not related to oral reading ability (discriminate validity), but is related to two peer-status variables of popularity and leadership (predictive validity). Individual differences associated with egocentrism were also explored: intelligence, socioeconomic status, sex, and age.

None of the major hypotheses were fully supported in preliminary analyses. The correlations among the three egocentrism tasks in the total sample were negligible (.03 to .18). Decentering ability was significantly related only to communicative egocentrism (.30 to .35). Discriminate validity of the construct is minimal in that two egocentrism tasks were significantly related to oral reading ability. Predictive validity is also minimal as indicated by the lack of any significant relations between popularity and leadership and the three egocentrism

tasks, except for leadership and the spatial egocentrism measures. Egocentric performance does not vary significantly as a function of sex, socioeconomic status, or intelligence. With one exception, egocentrism is significantly but only moderately, related to chronological age and mental age (.23 to .39 in the total sample).

Egocentrism in Children: Its Generality and Correlates

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Egocentrism is defined by Piaget (1967) as the child's inability to adopt a point of view different from his own. Thus, there is an absence of "both self-perception and objectivity" (Piaget, 1954, p. xii). The construct of egocentrism is crucial as a descriptive and explanatory concept in Piaget's theory of the child's construction of reality: "The important point is that . . . the child of seven years begins to be liberated from his social and intellectual egocentricity and becomes capable of new coordinations which will be of the utmost importance in the development of intelligence and affectivity" (Piaget, 1967, p. 41).

The importance of the construct within the theory is apparently largely based upon its generality as an intellectual tendency or "trait." The generality takes two forms: a response tendency occuring across the ontogenetic span from infancy through adolescence, and occuring across diverse content areas. In the first case, egocentrism is defined very broadly as a lack of differentiation in subject-object interaction. As Elkind (1967) notes, "at each stage of mental development, this lack of differentiation takes a unique form and is manifested in a unique set of behaviors" (p. 1025). Whereas the degree of uniqueness of these behaviors might well be cause for questioning whether they are manifestations of a single tendency, egocentrism, the focus of the current study deals with the generality of egocentrism within a particular stage of development (concrete-operational stage) but across

content areas. Egocentrism has been invoked as an explanation of children's immature or distorted concepts of causality (Piaget, 1930), morality (Piaget, 1932), space (Piaget & Inhelder, 1956), relational concepts (Piaget, 1928), and difficulties in communication (Piaget, 1926). The major empirical support for egocentrism as a general trait is Piaget's finding that in testing different groups of children in diverse content areas there is a rather substantial waning of egocentrism at 7 - 8 years of age. At no time has the same group of children been tested on a variety of egocentrism tasks to determine the extent to which the individual, the task, or the interaction between them may account for variations in egocentric behavior. It would appear that the construct has had sufficient face validity to stimulate very little research dealing with its convergent or construct validity. The primary exception is a study by Weinberg (1963) in which he compared the degree of relativistic thinking (as measured by children's understanding of relational concepts like "brother," and "left," "right") with "egocentricity measures" on two categorization tasks, the latter being defined as concrete, personal object sorting vs. abstract and conceptually differentiated. With children between 6 1/2 and 7 1/2, approximately, as Ss, correlations between relativism and the categorization tasks were .22 and .25. There is some reason to question, however, the definition of non-egocentric behavior as the categorization of objects into abstract and functional categories.

The primary focus of the present study is to examine the convergent validity of egocentrism, and to a lesser extent, the construct and discriminant validity. The three egocentrism measures will deal with spatial egocentrism, communicative egocentrism, and role-taking ability. Convergent validity, as discussed by Campbell and Fiske (1959), would be supported by

a high association among three independent measures of egocentrism. The hypothesis concerning the generality of egocentrism is as follows: There is a high, positive correlation in egocentrism scores on spatial, communication, and role-taking tasks.

Spatial egocentrism is the most literal example of "the child's inability to adopt another's viewpoint." In Piaget and Inhelder's classic study (1956), a landscape of three mountains was presented and the child asked to imagine what a doll "saw" at various locations around the landscape. Prior to 7 years of age, approximately, children generally assume that the doll sees what they see regardless of the doll's position. This task, with some modification is used in the present study to assess spatial egocentrism.

"Another's viewpoint" may be more figurative than literal in the case of discriminating another person's needs or attitudes. One method of studying such a capacity is to determine how effectively children communicate to one another. Specifically, to what extent they take into account the needs of their listener when giving a message. Piaget (1926), for example, had a child listen to a story and then retell it to another child. Again, children between 6 and 8 years of age were found generally not to communicate the story clearly, because, in Piaget's view, they failed to orient themselves to the listener. In the present study, a communication task was adapted from Cowan (1966) which clearly presented a conflict between the child and his listener's viewpoints. The child was asked to describe what he was doing in a simple task to a listener who could not see him, but who was trying to replicate what the child was doing.

A final measure of egocentrism relates to the child's role-taking skills. Piaget's strategy (1928) was to make inferences about role-taking skills from the assessment of the child's understanding of various relational concepts. That is, the meaning of the relations themselves implied a notion of differing viewpoints. For example, it was found that up to 7 or 8 years of age, the child can identify his own right and left arms but not those of a person facing him, and has difficulty recognizing that "left" and "right" applied to objects in a line are relative, not absolute, attributes. Such experimental tasks have been discussed by Flavell (1968) as percpetual role-taking tasks, as compared to cognitive role-taking. The task used in this study is similar to one used by Flavell in which the child must respond to a vertical sequence of pictures which are reversed in sequence for the experimenter.

Piaget has suggested in numerous writings (1960, 1967, 1969) that egocentrism is largely based on an underlying process of attention deployment or intellectual decentralization. That is, that objectivity increases (or eogcentrism wanes) to the extent that the child learns to attend to other cues or "information" (e.g., another person's spatial position, his needs as a listener, his role, etc.) rather than centering attention only on his own viewpoint. To date, there have been few attempts to devise a method of assessing intellectual decentration, the primary one being related to the ability to simultaneously take several roles in telling a story (Feffer & Gourevitch, 1960). Intellectual decentering appears to be quite similar to Guilford's "divergent thinking" capacity (1959). For the present study, two types of tasks were used based on Wallach and Kogan's measures of creativity drawn in large measure from divergent thinking tasks (1965). Basically, the tasks

assess the extent to which children can go beyond obvious similarities of a group of objects, or obvious possible uses of familiar objects, i.e., to decenter attention sufficiently to conceptualize other similarities and uses beyond the obvious. Particularly unique responses were not of special interest, as they are in measuring creativity. The hypothesis, based on Piaget's theory, is that there is a high correlation between decentering ability and performance on each of the three egocentrism tasks.

It appeared worthwhile to attempt some indication of the discriminant validity of egocentrism. That is, egocentrism should be able to be delimited or defined in terms of "what it is not." Thus, a measure of a theoretically unrelated intellectual ability should show very low, if any, correlation with measures of egocentrism. For this purpose, an oral reading test was used since there is no theoretical reason to suspect that such ability relates to egocentrism.

Besides examining the convergent and disciminant validity of egocentrism, a modest effort was made to indicate the construct validity. If it is true, as Piaget suggests, that egocentrism of the child profoundly influences his social interactions, then it seems reasonable to suggest that certain social status factors like popularity among peers, and leadership might well relate to egocentrism. Specifically, it is assumed that some degree of popularity and leadership capacity depends on the child's ability to take others' viewpoints, to cooperate, discuss, etc., during the early school years. Therefore, it is hypothesized that there is a high correlation between egocentrism and peer-ranked popularity and leadership.

There have been several studies indicating some relationship between various types of egocentrism and various individual difference variables

(e.g., Gollin, 1954, 1958; Wolfe, 1963). The following variables were investigated as possible correlates to egocentrism: age, mental age, sex, and socio-economic status.

Method

Subjects

Eighty Negro children drawn from Grades 1 through 4 at two Detroit schools served as subjects. Twenty children represented each grade level, half being boys and half girls. A sample description in terms of age and intelligence, as measured by the Peabody Picture Vocabulary Test, at the two schools is presented in Table 1.

Insert Table 1 about here

The schools were chosen to represent lower- and middle-socio-economic status. Data concerning the children's parents' income and/or occupation were either very incomplete or totally absent from school records. Therefore, the criteria for selecting the school was based on the 1966 survey of Southwestern Michigan conducted by the Detroit Regional Transportation and Land Use Study (Rubin, 1968). In the lower-socio-economic status school, the median annual income of household heads was $2,800 in the geographic area served by the school. In this area, household heads having 8 years or less of education comprised 44% of the population, and an additional 30.5% had 9 to 11 years of education. The percent of households that are non-white is 87.8. The middle socio-economic status school served an area with a median annual income of $10,150. Heads of household who had had 8 years or less of education compirsed 13% of the population, and an additional 11.4%

had 9 - 11 years. College graduates represented 35% of the population (as compared to 4% in the lower-socio-economic area). The percent of non-white households is 17.4. Since the time of this survey, there has been an increased number of low-income families in the latter school area, but in a rather clear geographic area. Therefore, children's addresses were also used in the middle-SES school to determine whether the children lived in the area, and, if so, were excluded. A total of six classes were sampled at the lower SES school, and four at the middle-SES school.

Tests

Piagetian task. Spatial egocentrism was assessed by a modification of Piaget's classic landscape task. It measured the child's ability to identify the arrangement of objects from another's position, as represented by a doll.

A 8 1/2-inch diameter posterboard served as the landscape base with a miniature gas station, two pumps, and Esso sign on it (Bachman series, N scale). At 0° orientation (i.e., from S's visual perspective or "south"), the station was centered toward the back of the landscape, the pumps were aligned in the front of the gas station on the station's right corner, and the Esso sign was to the left of the station, approximately mid-way between the pumps and station on the near-far dimension.

Various perspectives of the landscape served as choices in the task. The choices were replicas of the standard scene oriented from four positions: 0° (south), 90° to S's left (west), 180° (north), and 270° (east). A fifth landscape represented an impossible perspective in that the objects were rearranged: the sign was closest to S, and centered; immediately behind it, centered on the base, was the station, and behind the station were the two

pumps. This arrangement was not only highly dissimliar from the standard scene, but was rather incongruous with the usual station arrangements, i.e., the pumps behind the station.

The five choices were placed to the right of the standard scene in a line with screens in between each sign to decrease direct visual comparisons. The choice scenes were rearranged after each trial so that the correct choice was differently located on each trial.

A girl or boy doll was used, depending on the sex of S, to elicit what S thought the landscape view would be from four positions. The doll was "seated" on a small stand so as to be looking down upon the scene from about 30°, the same approximate angle at which S actually viewed the scene.

Communication task. The communication task was designed to assess the child's ability to take into account the needs of his listener. The task, a modification of one used by Cowan (1966), requires that a child essentially tell a person (E) exactly where on a small checkerboard he is placing particular objects, given that the listener is attempting to duplicate S's behavior but cannot see what he is doing.

Six toy objects were given to S to use: a gray gorilla, a brown gorilla, a gray moose, a brown moose, a small gray pot, and a larger gray pot. A 6 X 9 inch checkerboard was used comprised of six 3 X 3 inch squares in two rows. The top row squares from left to right were red, red, yellow; the bottom row, yellow, red, yellow.

Masking task. This is a modification of a task used by Flavell (1968, p. 170) to assess perceptual role-taking in early childhood. The materials consisted of a posterboard, 11 X 16 inches, each side of which contained the

same four colored pictures, but in the reverse vertical order. That is, the S saw the following starting at the top: a fireman with hose, a traffic stoplight, a tiger, a hotdog in a bun. In addition, E had two masking strips, 4 X 16 inches, which extended beyond the posterboard 2 1/2 inches on each side and was clearly visible to S. The task was simply for S to infer what pictures S could "still see" when she masked certain positions on her side of the board, given the reverse order of the pictures. A practice trial was given to insure that S understood the instructions. In this case, a posterboard measuring 11 X 9 1/2 inches was used showing at the top, on S's side, a mailman, and on the bottom a box of crayons.

Decentration task. Two tasks were designed to assess the child's ability to deploy attention. The tasks are adaptations of creativity measures from Wallach and Kogan (1965). (1) The first task, labeled Similarities, is a presentation of several familiar objects requiring that the child find as many similarities among all the objects as possible. That is, the test is designed to determine how many shared attributes the child can discover beyond the immediate, apparent ones. Two groups of items were presented: a safety pin, large needle, scissors, can opener (metal group); and a postage stamp, cocktail napkin, small box, and small spiral notebook (paper group). A practice item preceded presentation of these items to ascertain that the child understood the task, in this case, finding as many similarities as possible between a blue plastic comb and a blue plastic toothbrush. (2) The second test, named Alternate Uses, required the child to name as many uses as possible for two familiar items which were presented on the table: a string and a towel. The practice item for this test was a chair.

Intelligence test. The Peabody Picture Vocabulary Test (Dunn, 1965) was employed to provide an estimate of verbal intelligence. S is presented with a series of pages showing four pictures on each page. The task is to match the word verbally given by E to one of the four pictures, e.g., "chicken," "blowing," "accident," etc. Raw scores of the number correct are converted into mental age scores and intelligence quotients.

Peer rankings. In each of the 10 classrooms from which Ss were drawn, all children were asked to name "your very best friend" and "your next best friend" as a measure of popularity. In Grades 1 and 2, E interviewed each child individually at the back of the classroom and encouraged each child to look around the room before making his judgments to facilitate his memory of classmates. The same procedure was used for measures of leadership: "If your class were going to elect a president of the class, who do you think would make the very best president?" and "who do you think would make the next best president?" In Grades 3 and 4, the children were given lists of all the children in their classroom and told to put a "1" beside their best friend, and "2" beside the next best friend, and this was repeated for leadership nominations.

Reading test. One additional assessment was made in the middle-SES school only to provide some indication or measure related to discriminative validity of the construct of egocentrism. Therefore, the Gray Oral Reading Tests (Gray, 1967) were administered. The child is presented with a series of paragraphs to read alond, E scoring the number of errors (omissions, substitutions, gross mispronuncia tions, etc.) and the time required, and converting these to a total score and grade equivalent.

Procedure

Each subject was tested individually in two sessions with a minimum of one day between sessions and a usual maximum of four days. For a few subjects, there was a longer duration between sessions due to school holidays or illness. The tests were administered to all subjects in the following order: Session 1, Piaget task and communication task; Session 2, decentering task, role-taking task, and Peabody Intelligence Task. For the Ss in the middle-SES school, the Gray Oral Reading Test followed the intelligence test. Each session lasted approximately 35 minutes. A total of 10 6-year-old Ss were pretested on the three egocentrism and decentration tasks to ascertain difficulty level and clarify procedures of testing.

Piagetian task. The standard gas station and choices were presented as S entered the room with the following instructions. E directed S's attention to the entire landscape and each item on it, and to each choice landscape, noting especially that the choices were oriented differently. S was administered a first practice trial as follows:

> "Now, you are looking at the station from here. One of these gas stations (E points to those to the right of S) looks just like this one--it shows exactly what you see from here. Which one shows how the gas station looks from here (E points to the south location of the standard where S stands)?" After S chose, E either stated the selection was correct, or corrected S as follows: "That's a good try. But look, this one is exactly like this one (pointing to the standard). See, here is the building, here is the sign and here are the pumps--in the same place as this one (points to each object's spatial location in turn). Do you see that?"

Trial 1 began as follows:

> "O.K. Now, here is a boy (girl) doll sitting on this. Watch. (E places doll at east). The doll is looking at the station, looking at everything from over here. What does the doll see? One of these (E points to stations at right) shows what the station looks like from where the doll is sitting. Look at this one, at this one,

> etc. (E points in turn to each of the 5 choices). Which one shows what you think the doll sees from here? Now think about it before you choose. Think what you would see if you were here. Now, what does the doll see from here?"

The instructions were repeated in Trials 2 - 4 with the doll being positioned subsequently at south, north, and west. Responses were recorded with no indication from E as to their correctness, except in the case of the practice trial. Children were not allowed to lean over the standard or move in any way so as to perceptually solve the task rather than inferentially solve it.

Communication task. The instructions were:

> "This game is called 'Teacher Tell Me' and you are the teacher! I'm going to do what you tell me to do. First, let me show you how the game is played. Here is a board with different colored squares, and here is a box with lots of things in it. (E presents items and gives S an opportunity to look them over.) When the game starts, you will pick out one of the things--anyone you want--and put it on one of the squares here--any square."
>
> "Now I have a board just like yours, and a box of things just like yours. I'm going to pick out the same thing you pick out, and put it on my board just where you put yours. But there's a problem! In this game, I can't see what you're doing. I'm going to be turned around like this (E turns), so you have to tell me just what you are doing so I can do it too. I'll listen very carefully to what you tell me. When we are through, if you've been a good teacher, my board will look just like yours--all the things will be in the same places as yours are."

If S seemed to have any questions, the instructions were repeated until E judged that S understood the game. After the task was completed, E recorded S's placements and led each S to think her board was similar to S's, i.e., that S had done the task well.

Masking task. The pretest card was presented and S was asked to name the mailman and the crayons, and E drew attention to which picture was on top. Then she showed her side of the board, noting identical pictures were on her side but in the reverse order. The instructions continued:

"Here is a piece of cardboard (masking piece). First I'll put it over the top of your side and the top of my side. Now, tell me which picture I can see on my side of the card? What can I see? (If S erred, he was corrected.) "This time I'll put the cardboard only on my side of the card. You can see both of your pictures, but I can see only one of my pictures. Tell me which picture I can see on my side." (E covers her bottom picture.) S was corrected if necessary.

The major test card was presented:

"Now, here is a new card with four pictures. Can you tell me what they are? Start up here (E accepted S's name unless completely wrong, and supplied the name if S had none.) E then reviewed the names from top to bottom. "Let's look at the other side, my side. It has the same pictures as your side. But where is the television this time? Right...on the top. On your side it was on the bottom. (E proceeded to point out the reversal by noting the differences in position.) First, I'll cover a picture on my side with the cardboard. Now, tell me which pictures I can see on my side."

E covered in sequence the following pictures on her side (labeling the pictures 1 through 4 beginning at the top): Trial 1, #2; Trial 2, #3 and #4; Trial 3, #3; Trial 4, #1, #2, and #3. At no time did E indicate the correctness of S's responses.

Decentering task. The Similarities subtest, always presented before the Alternate Uses subtest, was introduced with the following instructions (practice test using toothbrush and comb):

"I am going to show you some things. You think of all the ways that these things are alike, all the ways they are the same or belong together. For example, here is a comb and a toothbrush. How are they alike or the same? ...Are there some more ways that they're alike?" After S responded, she continued, "That's very good. You've already said some of the things I was thinking of too. Let's see... they are also alike because they both have...(E presented similarities S did not mention, such as color, material, can be bought at a drug store, used to dress up, etc.) "There are lots of ways they are alike, aren't there? That's how we play this game--thinking up all the ways things are the same or belong together." After checking that S thinks he understands the intent of the game, E continues, "I'll show you a group of things and you tell me all the ways you can think of that these things are the same." E presents "metal group" first, and then "paper group."

Instructions for Alternate Uses subtest were as follows:

> "Now in this game I'll name an object--like a light bulb--and the game is for you to tell me all the different ways you could use that thing, that object. Any object can be used in a lot of different ways. For example, think about a chair. What are some of the ways you can think of to use a chair? ...Yes, those are fine. There are lots of ways (E mentions some), and you thought up some good ways, too. I can see you understand how we play the game. So let's being now--and remember, think of all the different ways you could use the object that I name. Tell me all the different ways you could use a string like this one (E presents string). ...Is there any other way you could use it?" The towel was presented next with shorter instructions. If S perseverated on one function, E would respond, "Yes, the X can be used for (summarized function), but tell me other, different ways you could also use it."

Other tasks. The standard instructions were used in presenting the Peabody Picture Vocabulary Test and the Gray Oral Reading Test as presented in the manuals to these tests.

Scoring

Two types of scores were derived for the three egocentrism tests: interval scores of various types reflecting the degree of egocentrism, and dichotomous scores of egocentric vs. non-egocentric. In relation to the latter type of score, it is clear from Piaget's writings on egocentrism that it is unlikely that it is an all-or-none cognitive state. At the same time, it could be that current measures are not sufficiently exact to actually reflect the degree of egocentrism. For example, is it psychologically meaningful to say that a child who can correctly infer what a doll sees at the south and west positions, but fails the north and east, is more egocentric than one who gets all four or even three positions correct? In order to determine whether the two types of scores are comparable, some analyses were carried out on both types of scores.

Piaget task. The interval scores were of two types: the number of correct trials out of 4, and a weighted score. The latter was a more qualitative

assessment of performances by giving weights to various types of errors. If a "south" orientation was chosen in error, a 0 score was given, i.e., the egocentric response of S's own visual perspective. The selection of the impossible scene was weighted 1, the reasoning being that S realized that the doll would see something different than he but did not know what that difference would be, and chose the "most different" one. An incorrect choice representing the view from one of the directions was weighted 2. In this case it would seem likely that S recognized that the doll saw something different than he, and had some idea of what that difference would be although it was incorrect. At the least, the objects were in correct relation to each other as is not true for the impossible perspective. Correct choices were weighted 3.* The dichotomous scoring was based on the number of trials passed with one exception: egocentric performance was defined as Ss who failed all trials, or who passed only 1 trial but that trial was when the doll was placed at the "south" position. All other scores were tallied as "non-egocentric."

Communication task. One point was given for each relevant attribute mentioned on each trial, such as the object selected, its color or size, the color of the square it was placed on, and the spatial position of that square. Sometimes the young Ss made errors in their attempts to take the role of the listener, particularly, for example, saying "left" when they meant "right" side of the board. In accord with Flavell (1966, p. 27), the issue was the child's role-taking activity as opposed to role-taking accuracy. Such errors as those mentioned were, therefore, not penalized. Rather the

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* The possible range of scores then were 0 - 12.

child was given one point for attempting to give a spatial direction for the listener. Some of the statistical analyses were done on a sum of relevant attributes mention across the total 6 trials. As will be discussed later, some analyses such as analyses of variance are based on the first 4 trials in order to meet some of the assumptions of that statistic. Dichotomous scores were defined in the following way: egocentric communication was a total across 6 trials of scores 0 to 12, and scores greater than 12 were deemed non-egocentric. The premise for this division was that Ss who merely named the object and the color square (2 points) would obtain a total of 12; any effort to specify more than this minimal information was viewed as an attempt to take into account the listener's needs, hence non-egocentric.

Masking task. Each trial was scored 0 to 4, a point given for S giving the correct pictures that E could see and not omitting any. Therefore by summing across 4 trials, the possible range was 0 to 16. The dichotomous score was based on the number of correct trials, the possible being 0 to 4. If S passed 0 through 2 trials he was deemed egocentric; scores of 3-4, non-egocentric.

Decentration task. The Similarities subtest was scored on the number of attributes which S cited that applied to all objects in the group, and that applied to that particular set of objects. For example, the latter criterion excluded such responses as "God made them all," or "you can buy them all," since such criteria apply to many objects. The total score was the sum of the attributes mentioned for both the "metal" and "paper" groups.

The Alternate Uses subtest was scored as the number of functions mentioned for the towel and string. Certain criteria were employed. First,

the function suggested should apply primarily to the particular object rather than any object, e.g., "you can fold it, you can throw it on the ground, etc.," would not be scored. Secondly, a function applied to the child or a person was scored 1 point, as well as the same function applied to an object. Repetitions of the same function with other objects was not scored. For example, if S stated that the towel could be used to "wash my face" and "wash the floor," 2 points were given; other objects such as "wash my hands," "wash the dishes with it" were not scored. Thirdly, the function had to be correct in terms of the properties of the object. For example, stating that the string could be used to swing from a tree received no points since the strength of the string was obviously not sufficient.

Because the Decentration tasks were dissimilar to some extent and were being used on an exploratory basis, it was deemed advisable to treat them as separate scores rather than combining the two subtests for a total decentration score.

Peer rankings. Peers cited by Ss as "my best friend" and "President" were given a weighting of "2" for each citation, and ratings of "my next best friend" and "Vice-President" were weighted "1." The weightings for each child were summed for popularity and leadership separately. The scores were categorized as follows. Low score was a 0, which indicated the S was not cited by any one in the class for popularity or leadership. Medium scores were defined as the next range of scores which includes about a third of the Ss in the class, each class being considered separately. Usually "Medium" scores category included scores of 1 to 3. "High" popularity or leadership categories included the top third of the scores approximately.

Results and Discussion

Frequency Distributions

Table 2 presents the frequency distributions of the three egocentrism tasks and the decentration tasks, the former measured in terms of interval

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Insert Table 2 about here

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scores and dichotomized scores. The interval scores represent the extent of non-egocentrism or objectivity (number correct). By visual inspection, the distributions of the three egocentrism tasks are markedly different in their shapes. The dichotomized scores, as previously defined, indicate that 46-65% of the sample is classified as egocentric, and 35-54% non-egocentric.

The discrepancies of the distributions of the interval scores, particularly, indicate that subjects' performance varied considerably from task to task. On the spatial task, most subjects performed at a very low level as is especially clear on the number of trials passed. In addition, of the 52 Ss who passed one trial only, all but 4 had passed this trial by correctly indicating what the doll saw when placed at "south," S's position also. The performance on the masking and communication tasks was superior to the spatial task performance, although the shape of the distribution on the masking task suggests "ceiling effects" may have operated. The rather substantial variations in the extent of egocentric performance (interval data) may be taken as direct evidence that egocentrism is influenced by task parameters. The variations in the dichotomized scores is not as marked, most likely reflecting the fact that the categorization criteria were somewhat relative to the sample tested.

The extent of the variations in distributions of scores also is relevant to the extent of intraindividual consistency. That is, to the degree that egocentric performance varies with particular tasks, indications of individual consistency are somewhat limited. For example, correlations between the spatial task, in which most Ss performed poorly, and masking, in which most performed well, would be, on a statistical basis, quite low.

Means and Ranges of Scores

An analysis of the scores by grade level and school are presented in Table 3. On the masking tasks, the means at the two schools were fairly

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Insert Table 3 about here

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similar at each grade level, with a marked improvement at both schools in performance between Grades 1 and 2. The similarities in mean scores for Grades 2 - 4 suggest a ceiling effect on the task. The spatial task elicited greater mean differences between schools, particularly unusually low performance in Grade 2 at the lower-SES school, and unusally high performance in the communication task appears between Grades 3 and 4. The decentration mean scores indicate, particularly in the Similarities subtest, a general improvement associated with grade level.

Correlations

The main hypothesis of this study is that egocentrism is a generalized intellectual tendency, and therefore the three measures of egocentrism should be positively and highly correlated with one another. The intercorrelations of interval scores presented in Table 4 clearly indicate

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Insert Table 4 about here

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that when all factors vary freely (e.g., age, IQ) the egocentrism scores have no relationship, i.e., range from -.03 to .18 for the total sample.

It was also hypothesized that intellectual decentration, as a process underlying non-egocentrism, correlates highly and positively with each egocentrism task. Again, this is clearly not supported in the case of spatial and role-taking (masking) egocentrism performance. Only in the case of communication do decentration tasks correlate positively and to a statistically significant degree. On the other hand, the magnitude of the correlations are not high, accounting only for 9 - 11% of the variance. It bears noting that the two measures of decentration correlate with each other (.37) to the same extent that each correlate with communication skills. The two subtests of the decentration task were treated separately, originally, since they were being used on an exploratory basis, and the moderate correlation between them would further suggest that they may well be measuring different types of skills.

It was expected that age would correlate with egocentrism and decentration scores which was found to be the case for all but the spatial task. In the latter task, the distributions of scores would suggest that the task was generally a difficult one for the large majority of subjects and the rather small degree of variability limits the size of the correlation (Guilford, 1956). It should be noted, too, that the correlation between decentration and communication that was significantly greater than zero may reflect only that each is related significantly to age differences.

Mental age, which was found to have a substantial relationship to chronological age (.65), correlates significantly with all egocentrism tasks and

decentration tasks. That is, the absolute level of mental development (or more correctly for the PPVT, absolute level of vocabulary development) is moderately and significantly related to performance on the other tasks. On the other hand, the index of brightness, the IQ scores, do not correlate significantly with the egocentrism tasks. Since IQ scores generally reflect the level of performance relative to one's age group, it would be expected that IQ and CA would not correlate as is the case in this sample. The fact that MA and IQ correlate .80 may reflect the fact that PPVT IQ derivations are not based on MA/CA x 100, but are standard scores in which an IQ of 100 was arbitrarily assigned to the mean raw score for Ss at each age level and the standard deviation set at 15 IQ points (Dunn, 1965).

Tables 5 and 6 present the same intercorrelations of variables as Table 4

Insert Tables 5 and 6 about here

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but for each of the schools separately. While there are some rather marked differences in correlations between variables for the two schools, only a few will be discussed here for reasons to be presented later. First, the intercorrelations of the three egocentrism tasks for the lower-SES school are similar to those for the total sample. However, the masking and spatial tasks and masking and communication tasks show slightly higher correlation in the middle-SES school, although neither reach statistical significance. One of the most discrepant correlations between the two schools is that concerning the decentration task of Similarities and communication: .17 for the middle-SES school, .52 for the lower-SES school. This may reflect the greater relation of MA and Similarities, and MA and communication in the lower-SES

group. It is also noteworthy that IQ and CA relate .32 in the middle-SES school, i.e., that the older children tended to be brighter on the whole, whereas in the lower-SES school, the relationship is -.17 indicating a trend toward less bright students in the upper grades (see Table 1).

In summary, it should be noted first that no partial correlations have yet been done to determine to what degree significant correlations between two measures may, in fact, reflect their relationship to a third factor. Such analyses are in the process of being done, and therefore conclusions based on the present analyses must take into account the fact that none of the variables, such as age or sex, was held constant. Secondly, to the degree that the distributions of scores used in these correlations are skewed or bi-modal, the correlations tend to be attentuated. That is, from "error" and unreliability of the tests, the present correlations would tend to underestimate the "true" relationship between variables.

Analyses of Variance (ANOVS)

An initial ANOV was performed on the interval scores to determine the amount of variance associated with age, schools, and tasks. Prior to considering the results of the analysis, it is important to point out a problem in applying ANOV to data from such a study. The data represent different measures of egocentrism and different metrics (e.g., the weighted type of errors in the spatial task versus the number of spontaneously emitted relevant attributes given in the communication task). This means the unit intervals are not directly comparable and, therefore, estimates of the influence of tasks on total variance would be overestimated by unit-metric differences beyond the "true" effects of tasks on egocentrism.

An adjustment was made in the data, therefore, to meet as closely as possible the assumptions of the ANOV and, at the same time, not influence significantly the variance of the scores. The adjustment which had been recommended in such situations (Nelsen, Grinder & Mutterer, 1969) is to make the ranges of possible scores as equivalent as feasible. Therefore, the communication task was rescored on the basis of the first four trials rather than all six trials, thus bringing the range of scores from 0 to 19, rather than 0 to 28. The spatial and masking scores used in the intercorrelations were retained, i.e., a range of 0 to 12 in the weighted spatial scores and 0 to 16 in the masking task.

The analysis of variance of the interval data, as presented in Table 7,

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Insert Table 7 about here

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indicate a highly significant difference among egocentrism tasks ($F = 134.06$, $df = 2,144$, $p < .01$) and a significant difference associated with grade level ($F = 3.74$, $df = 3,72$, $p < .05$). The effects of socio-economic status on egocentrism performance, as well as all interactions, were non-significant sources of variance. Means of tasks indicated that the most difficult task was the spatial task, the next most difficult was communication, and the easiest was the masking task. Means of performance at the various age levels indicated increasing improvement with increasing age, the greatest improvement across tasks being between Grade 3 and 4.

Another ANOV was performed on the dichotomized data. These data represent less of a problem than the interval data in terms of metric differences among tasks, as discussed previously. The analysis again revealed a significant difference among tasks ($F = 6.13$, $df = 2,144$, $p < .01$). However, age was found

not to be a significant factor, nor were any interactions significant. That is, when Ss' performance is classified as egocentric vs. non-egocentric, there are no significant age differences in this sample. In fact, the relative difficulty of tasks was changed by the classification of the data: the Piaget test had fewest Ss classified as non-egocentric, the masking task, next, and the communication task had the highest number, as reflected in Table 2.

These analyses are based on a fixed-effects model since the three egocentrism tasks, for example, are not a random selection of possible tasks. Although the analyses given to date indicate what factors account for a statistically significant portion of the total variance, the relative contributions of the various sources need to be assessed by portioning the variance components. These analyses have not yet been completed. Likewise, a more complete ANOV is planned to determine the effects of grade, schools, sex, and intellectual level on the three tasks (i.e., a 4 X 2 X 2 X 3 X 3 with repeated measures on the last factor).

Popularity and Leadership Ratings

It was predicted that the egocentrism scores would relate to peer-rated measures of popularity and leadership. $\underline{X}^2$ tests were performed on the dichotomized scores of each egocentrism task, in conjunction with three categories of popularity and leadership: high, medium and low, as previously defined. None of the analyses were statistically significant except in the case of leadership and performance on the spatial task ($X^2 = 4.87$, $df = 2$, $p < .05$, one-tailed test).

Oral Reading Scores

In order to obtain some indication of discriminant validity of the egocentrism tasks, an oral reading test was administered to all Ss in the middle-SES school. It was predicted that the relationship between oral reading skill and each egocentrism task would be negligible. This was found to be so in the case of the spatial weighted scores and oral reading (r = .09), but clearly not so in the other two cases: masking task and oral reading, r = .33, df = 38, $p < .05$; and communication and oral reading, r = .66, $p < .01$. These latter correlations are not only statistically different than zero, but are of greater magnitude than the correlations among the three egocentrism tasks. It is not unexpected, however, that the relation between oral reading and oral communication might be higher than the oral reading to other measures, but the degree of relationship is substantially higher than would be expected if it is true that the communication task is measuring egocentrism primarily. Indeed, such a correlation suggests that it is the "content" of the problem that may most clearly predict performance, i.e., verbal skills vs. spatial or numerical skills, for example.

Sex Differences

A gross measure of possible sex differences in performance on the egocentrism tasks was performed prior to the completion of the five-way ANOV. The weighted spatial scores, masking scores, and scores on 6 trials of the communication task were divided at the median for boys and girls (across age and schools). X^2 analyses indicated no significant sex differences in performance on the three egocentrism tasks.

Conclusions

Given that many of the results presented so far are preliminary to more thorough analyses, the conclusions can be, likewise, only tentative. However, there are some analyses which bear further discussion. The major focus of this study was the degree of generality of egocentrism, or its convergent validity. When all factors varied freely, it was found that all intercorrelations among measures for the total sample and for each school subsample were not signficantly different from zero. Such lack of relationship suggests that (1) none of the tasks adequately measure egocentrism; (2) some of the tasks do not adequately measure egocentrism; or (3) egocentrism is not a functional unity. There is little empirical basis for determining which of these alternatives is most tenable. However, it would seem most reasonable to suggest that there are substantial problems with the methods of measurement before assuming that it is the concept or theory, rather than the measures, that are in error.

First, the landscape task seems to be the most generally accepted method of measuring spatial egocentrism, if not "general egocentrism" (e.g., see Neale, 1966). However, it seems highly likely that the task not only taps the child's ability to infer visual changes contingent upon positional changes, but to require the simultaneous reversing of two spatial dimensions (near-far and right-left). That is, it may be that the landscape task requires one or more spatial skills that have little to do with the core concept of egocentrism. Likewise, it is clear that the masking task is a perceptual role-taking task that has certain spatial concepts imbedded in it: the ability to remember a reversed vertical order and the ability to

infer the effects of masking certain portions. However, the fact that the spatial and masking tasks did not correlate highly would make less tenable the proposition that they are similar in being of "spatial" content. Although all three tasks have some face validity of situations in which a person must take another's point of view, it is clear that none tap the more conceptual egocentrism ability of infering another's needs, attitudes, values, etc., as might be tapped in assessing a person's ability to persuade another, or a young child's ability to adapt his selection of a gift for his mother to her preferences and needs. It would be of theoretical import to find whether the types of perceptual role-taking and communication skills measured in the present study relate to such cognitive role-taking skills.

Whether it is legitimate to pool all subjects in the correlational analyses awaits further tests of possible sex and socio-economic school analyses. For example, it may be that some interrelationships are masked by the effects of some independent variables. Likewise, the correlations are, to various degrees, most likely underestimations or conservative estimations in that they are based on somewhat skewed distributions. Thirdly, the correlations tend to be underestimations of relationship to the extent that the measures are unreliable. Lastly, it must be pointed out that the correlations are based on a sample which was entirely Negro, and half the sample represented a very low socio-economic strata. The generality of the findings of this study are limited to the extent that such factors as race and socio-economic status are significantly related to egocentrism. The relative contributions of tasks and persons, i.e., generality across tasks and intra-individual consistency, await further analyses.

The findings to date not only indicate that the generality of egocentrism is very low, but that two of the measures of egocentrism (masking and communication) were found to be significantly related to a skill, which, theoretically, they should not relate to: oral reading. Such findings lessen the confidence that the tasks actually measure what they are designed to measure. It is not, then, wholly unexpected that these measures do not relate to others behaviors which, theoretically, they should, i.e., popularity and leadership rankings among peers. At the least, these initial findings suggest the need for more careful analysis of egocentrism tasks used in research and more limited interpretations of their meaning.

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Table 1

Means and Ranges of Age and Peabody Picture
Vocabulary Scores of Subjects by Grade and School

Grade	School SES	C. A. Mean	C. A. Range	M. A. Mean	M. A. Range	IQ Mean	IQ Range
1	Low*	6.5	6-2 to 6-8	5.5	4-0 to 6-10	88.5	73 - 103
	Middle	6.6	6-6 to 6-10	6.1	5-1 to 7-6	90.5	79 - 104
2	Low	7.5	7-0 to 7-11	6.3	4-3 to 8-11	89.2	68 - 120
	Middle	7.6	7-5 to 7-9	7.3	5-2 to 10-2	95.3	74 - 118
3	Low	8.5	8-1 to 9-1	8.0	6-6 to 10-7	94.7	81 - 123
	Middle	8.7	8-6 to 9-0	8.8	6-6 to 10-2	97.2	78 - 108
4	Low	9.5	9-3 to 9-10	7.3	6-1 to 8-9	81.7	70 - 98
	Middle	9.9	9-4 to 10-2	9.8	7-8 to 13-0	100.1	82 - 126

* N = 10 at each grade at each school.

Table 2

Frequency Distribution of Scores

Spatial				Masking		Communication				Decentration			
Correct Trials		Weighted Scores				(6 Trials)		(4 Trials)		Similarities		Uses	
Score	N	Score	N	Score	N	Score	N	Score	N	Score	N	Score	N
0	4	0	0	0-1	0	0-1	0	0-1	0	0	0	0	0
1	52	1	1	2-3	0	2-3	0	2-3	1	1	0	1	0
2	19	2	0	4-5	1	4-5	1	4-5	2	2	2	2	0
3	3	3	30	6-7	4	6-7	1	6-7	3	3	4	3	2
4	2	4	8	8-9	6	8-9	0	8-9	34	4	18	4	6
		5	7	10-11	8	10-11	5	10-11	18	5	14	5	5
		6	8	12-13	17	12-13	25	12-13	10	6	17	6	5
		7	3	14-15	22	14-15	16	14-15	1	7	13	7	17
		8	12	16	22	16-17	8	16-17	7	8	7	8	16
		9	3			18-19	4	18-19	4	9	3	9	10
		10	5			20-21	3			10	2	10	7
		11	1			22-23	1					11	1
		12	2			24-25	3					12	4
						26-27	2					13	4
						28	1					14	3

Dichotomized Scores		N		N		N
Egocentric	(65%)	52	(46%)	37	(49%)	32
Non-egocentric	(35%)	28	(54%)	43	(51%)	48

Table 3

Means and Ranges of Scores by Grade and School

	Grades							
	1		2		3		4	
School SES	Low	Middle	Low	Middle	Low	Middle	Low	Middle
Masking								
Mean	11.7	11.2	13.2	13.1	13.0	13.2	13.8	13.5
Range	6-16	6-16	8-16	4-16	8-16	10-16	10-16	6-16
Spatial*								
Mean	5.9	4.9	3.3	5.7	6.6	5.0	5.7	6.3
Range	3-10	3-10	1-5	3-10	3-10	3-11	3-12	3-12
Communication†								
Mean	8.2	9.8	10.4	9.5	10.3	9.9	11.2	12.6
Range	3-12	6-13	8-18	8-11	8-18	4-17	7-17	4-19
Decentering: Similarities								
Mean	4.4	5.4	5.9	5.1	5.9	6.3	6.0	6.4
Range	2-7	3-7	3-9	4-9	4-10	4-10	4-8	4-8
Decentering: Uses								
Mean	7.6	6.1	7.4	7.4	8.5	7.8	9.1	10.6
Range	4-12	3-8	6-9	3-13	6-14	5-10	5-14	7-13

* Weighted.
† Total Trials 1-4.

Table 4

Intercorrelations of Egocentrism Scores, Decentration, and Independent Variables for Total Sample (N = 80)

	Masking	Communication	Decentration: Similarities	Decentration: Uses	CA	MA	IQ
Spatial	.15	-.03	.07	.09	.16	.23*	.18
Masking		.18	.10	.11	.25*	.23*	.12
Communication			.35**	.30**	.39**	.37**	.20
Decentration: Similarities				.37**	.29**	.35**	.27*
Decentration: Uses					.41**	.27*	.08
CA						.65**	.10
MA							.80**

Df = 78:
* p <.05 = .221
** p <.01 = .287

Table 5

Intercorrelations of Egocentrism Scores, Decentration, and Independent Variables for Low Socio-Economic Status School (N = 40)

	Masking	Communication	Decentration: Similarities	Decentration Uses	CA	MA	IQ
Spatial[1]	.02	-.05	-.10	-.02	.17	.22	.08
Masking		.13	-.07	-.12	.29	.14	-.10
Communication			.52**	.40*	.35*	.45**	.20
Decentration: Similarities				.28	.32*	.45**	.29
Decentration: Uses					.25	.12	-.06
CA						.55**	-.17
MA							.70**

1. Weighted scores.
Df = 38:
* p<.05 = .313
** p<.01 = .403

Table 6

Intercorrelations of Egocentrism Scores, Decentration, and Independent Variables for Middle Socio-Economic Status School (N = 40)

	Masking	Communication	Decentration: Similarities	Decentration: Uses	CA	MA	IQ
Spatial[1]	.25	.00	.24	.17	.15	.25	.29
Masking		.23	.23	.26	.24	.32**	.32**
Communication			.17	.23	.42**	.31*	.17
Decentration: Similarities				.45**	.26	.28	.22
Decentration: Uses					.54**	.41**	.23
CA						.75**	.32**
MA							.85**

1. Weighted scores.

Df = 38:

*p<.05 = .313

**p<.01 = .403

Table 7

Analysis of Variance of Total Correct Scores[1]

	Sources of Variance		
	df	MS	F
Between Subjects			
Grades (A)	3	39.31	3.74*
Schools (B)	1	0.70	<1.00
A X B	3	4.08	<1.00
Subjects within Groups	72	10.49	
Within Subjects			
Egocentrism Tasks (C)	2	1127.46	134.06**
A X C	6	8.79	1.04
B X C	2	1.82	<1.00
A X B X C	6	10.11	1.20
C X Subjects within Groups	144	8.41	

1. First 4 Trials of Communication Task.

*p<.05 = 2.74 (df = 3,72)

**p<.01 = 4.10 (df = 3,72)

**p<.01 = 4.77 (df = 2,144)